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| 09/612,298 | 07/07/2000 | Tatsuya Kunikiyo | 193414US2 | 8554 |

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EXAMINER

CAO, PHAT X

ART UNIT PAPER NUMBER

2814

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/612,298

Applicant(s)

KUNIKIYO, TATSUYA

Examiner

Phat X. Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7-15 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-12 and 21-23 is/are allowed.
- 6) ☒ Claim(s) 1,7,9 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 7, 9, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP. 10-199882 in view of Lee (US. 5,441,915).

With respect to claims 1, 7 and 9, JP ('882), in Fig. 1 and abstract, discloses a semiconductor device comprising: a semiconductor substrate 1 having a main surface along which a semiconductor element is formed; interlayer insulating films formed on the main surface; conductive interconnections 3, 5, 7, and 9 provided in a plurality of layers separated by the interlayer insulating films; conductive dummy interconnections 3A, 5A, 7A, and 9A provided in the plurality of layers so that every one of the conductive dummy interconnection is formed in a layer of the plurality of layers with at least one conductive interconnection, wherein the dummy interconnections are provided to sandwich an interconnection part included in the interconnections in at least one of the two or more layers; and a conductive dummy plug 4b, 6b, and 8b selectively buried in the interlayer insulating films to connect the dummy interconnections all together.

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JP ('882) does not disclose the dummy interconnections connected to a potential power supply line.

However, Lee, in column 5, lines 57-65, teaches the obviousness of having the dummy lines left floating or grounded depending on their locations. Accordingly, it would have been obvious to connect the dummy lines of JP ('882) to the ground line because according to Lee, the dummy lines would be grounded when the dummy lines are adjacent to signal lines (see column 5, lines 62-65) for the known purpose of preventing cross-talk.

With respect to claims 13-14, JP ('882) also discloses in Fig. 3 the forming of a passivation film 11 covering the uppermost layer and having a higher thermal conductivity than the interlayer insulating films, and the forming of a heat sink 12 which is in contact with the passivation film 11.

With respect to claim 15, in view of teachings of Fig. 2 of JP ('882), it would have been obvious to modify Fig. 3 of JP ('882) by forming another conductive dummy plug (see dummy plugs 10b in Fig. 2) buried in the passivation film to connect the heat sink 12 and part of the dummy interconnection for the purpose of performing heat dissipation more efficiently (see abstract).

3. Claims 1, 7, 9, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP. 10-199882 in view of Ma (US. 5,729,047).

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As discussed in details above, JP ('882) substantially reads on the invention as claimed, except it does not disclose the dummy interconnections connected to a potential power supply line.

However, Ma, in Fig. 3, teaches the obviousness of forming the dummy interconnections surrounding the signal interconnection line 90 and connecting to the potential power supply line Vss. Accordingly, it would have been obvious to connect the dummy interconnections of JP ('882) to the power supply line Vss because according to Ma, such modification would provide a signal isolation and decoupling in an integrated circuit device (column 1, lines 55-60).

Allowable Subject Matter

4. Claims 10-12 and 21-23 are allowed.
5. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art fails to disclose the combination of the structure having every one of the conductive dummy interconnection being formed in a layer of the plurality of layers with at least one conductive interconnection, and the dummy interconnection which is provided in a layer located over the at least one layer to cover the interconnection part.

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Response to Arguments

6. Applicant argues that Fig. 2 of JP. '882 does not suggest the invention as amended because the layer in which the conductive dummy interconnection 12 is formed does not have at least one conductive interconnection.

The Examiner agrees that Fig. 2 does not suggest the above feature. However, **Fig. 1** of JP '882 does suggest the invention as amended (see new ground of rejection for more details).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (703) 308-4917. The Examiner can normally be reached on Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessfully, the Examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. Group 2800 fax number is (703) 308-7722 or (703) 308-7724.

PC
May 30, 2003


PHAT X. CAO
PRIMARY EXAMINER